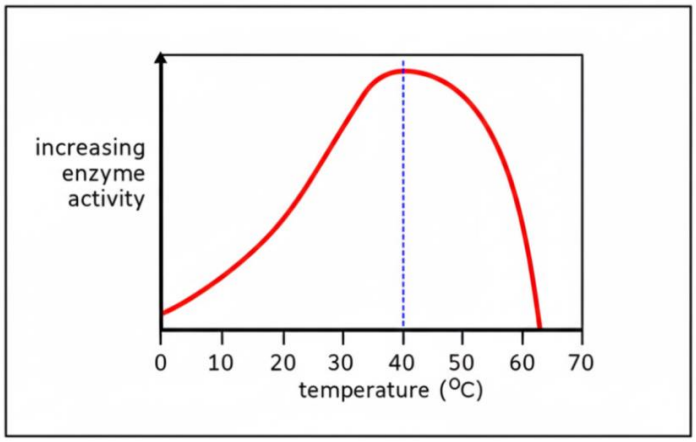
1) Water rises from the roots through the stem in a plant against the force of gravity due to the _____ force in water. However, what keeps the column of water together as the water rises is the _____ force between the water molecules.

a)adhesion, cohesion
b) cohesion, adhesion
c) cohesion, capillary action
d) surface tension, adhesion
e) capillary action, adhesion

2) A solution with a pH of 3 is _____ times more acidic than one with a pH of 6.

a) 2
b) 3
c) 10
d) 100
e) 1,000

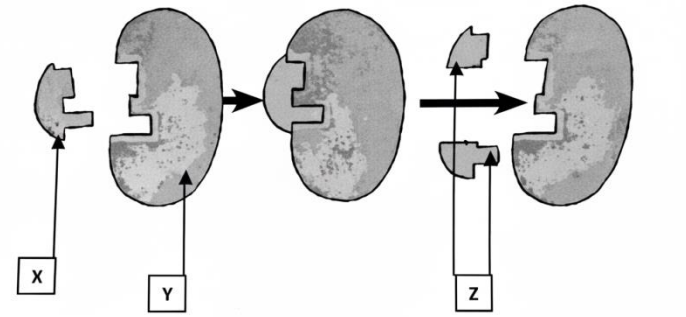
3) using the diagram



at 62°C?

a) No prediction would be valid.
b) An amount of product equal to that at 20°C would form.
c) An amount of product equal to that at the optimum temperature would form.
d) An amount of product equal to that at 5°C would form.
e) Little or no product would form.

4)The following figure represents the action of an enzyme on a substrate.



X, Y, and Z are respectively:

a) Enzyme, product, substrate
b) Product, enzyme, substrate
c) Substrate, enzyme, product
d) Product, substrate, enzyme
e) Enzyme, substrate, product

5) Which of the following organic compounds is capable of performing the following functions: transport substances, make hormones and **speed up reactions?**

a) carbohydrates
b) proteins
c) lipids
d) nucleic acids
e) A and B

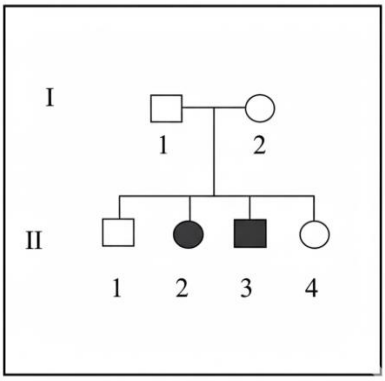
6) The ABO blood type system is a system that codes for agglutinogen at the level of red blood cells thus determining the blood type. Blood transfusions are conducted in several cases such as bleeding. The possible transfusion according to the ABO blood type system is

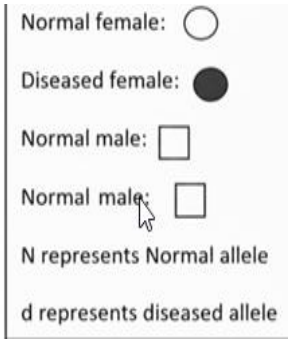
a) A → AB
b) AB → A
c) A → O
d) AB → O
e) AB → B

7) A test cross is done to

a) determine if crossover has occurred.
b) prevent sex-linked traits from being passed on.
c) determine if a person has Huntington's disease.
d) prevent crossover from occurring.
e) determine if an organism with the dominant phenotype is homozygous dominant or Hybrid

8)The following pedigree shows the transmission of an autosomal recessive disease in a certain family.





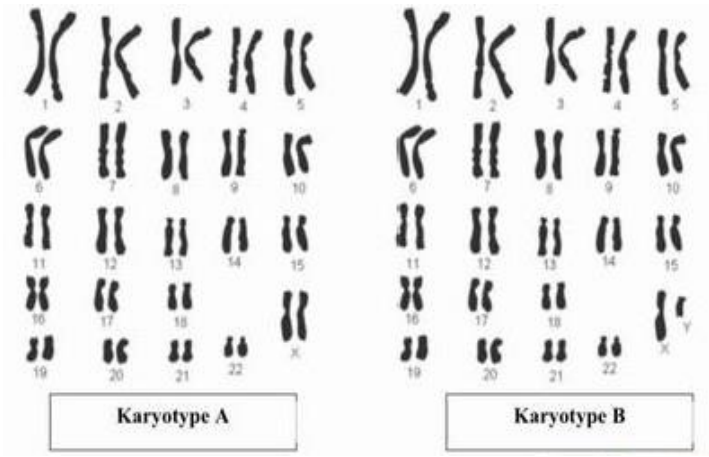
The genotype of individual 1 is

a) NN
b) Nd
c) dd
d) Maybe NN or Nd
e) Maybe Nd or dd

9) In a dihybrid cross with independent genes present on different autosomes, the phenotypic proportion of F2 generation is:

a) 1/4 - 1/4 - 1/4 - 1/4
b) 1/2 - 1/2
c) 3/4 - 1/4
d) 9/16 - 3/16 - 3/16 - 1/16
e) 8/9 - 3/9 - 3/9 - 1/9

10) A karyotype shows the number and appearance of chromosomes in the nucleus of a eukaryotic cell. Consider the following two karyotypes:



Which statement correctly reflects the gender?

a) Karyotype A belongs to a male because of the presence of XX pair
b) Karyotype B belongs to a female because of the presence of XY pair
c) Karyotype B belongs to a male because of the presence of XY pair
d) Karyotype B belongs to an abnormal female because of the presence of two chromosomes XY
e) Karyotype A belongs to an abnormal female because of the presence of two chromosomes XX

11) In the case of pea plants, tall (T) is dominant over dwarf (t). What is the genotype of the parents of a generation of plants half of which are tall and half of which are dwarf?

a) $Tt \times tt$
b) $Tt \times Tt$
c) $TT \times tt$
d) $X^TX^t \times X^TX^t$
e) $X^T X^T \times X^tX^t$

12) A man with hemophilia marries a woman who has normal hemoglobin and is not a carrier. Which of the following is true?

a) None of their children will have the disease nor will they be carriers.
b) All the boys will have the disease.
c) All the girls will have the disease.
d) All the boys will be carriers.
e) All the girls will be carriers.

13 - In the fruit fly Drosophila, there are 8 chromosomes in each somatic cell. How many chromosomes would be found in a normal gamete?
a) Two
b) Four
c) Eight
d) Ten
e) Sixteen

14- Which of the following is a polysaccharide?
a) Catalase
b) Testosterone
c) Glucose
d) Glycogen
e) Hemoglobin

15- A polysaccharide found in plants whose function is storage is
a) Starch
b) Glycogen
c) Chitin
d) Glucagon
e) Cellulose